

REMARKS

Reconsideration and allowance of the present patent application based on the foregoing amendments and following remarks are respectfully requested.

By this Amendment, claims 1 and 18 are amended and claims 27 and 28 are cancelled without prejudice or disclaimer to the subject matter therein. Claims 1 and 18 are amended to positively recite the features of claims 27-28. No new matter has been added. After entry of this Amendment, claims 1, 2, 6, 7, 11 and 14-28 will remain pending in the patent application.

Claims 1, 2, 6, 7, 14-21 and 23-28 were rejected under 35 U.S.C. §103(a) based on Honda *et al.* (U.S. Pat. No. 5,851,643) (hereinafter "Honda") in view of Hikosaka *et al.* (U.S. Pat. No. 5,792,564) (hereinafter "Hikosaka"). The rejection is respectfully traversed.

Claims 27 and 28 are cancelled without prejudice or disclaimer, thus rendering moot the rejection of these claims.

Claim 1 recites a perpendicular magnetic recording medium comprising, *inter alia*, a first perpendicular magnetic recording layer formed on the nonmagnetic substrate at room temperature, wherein the first perpendicular magnetic recording layer has an easy axis of magnetization in a vertical direction, and contains cobalt, oxygen, and at least one of platinum and chromium; a second perpendicular magnetic recording layer formed on the first perpendicular magnetic recording layer at room temperature, wherein the second perpendicular magnetic recording layer has an easy axis of magnetization in the vertical direction, and mainly contains a crystalline alloy, and the crystalline alloy contains cobalt, chromium, platinum, and at least one rare earth element selected from the group consisting of yttrium, lanthanum, cerium, praseodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, thulium, ytterbium, and lutetium.

Claim 18 recites a magnetic recording/reproduction apparatus comprising a perpendicular magnetic recording medium that comprises, *inter alia*, a first perpendicular magnetic recording layer formed on the nonmagnetic substrate at room temperature, having an easy axis of magnetization in a vertical direction, and containing cobalt, oxygen, and at least one of platinum and chromium; and a second perpendicular magnetic recording layer formed on the first perpendicular magnetic recording layer at room temperature, having an easy axis of magnetization in the vertical direction, and mainly containing a crystalline alloy, the crystalline alloy containing cobalt, chromium, platinum, and at least one rare earth element selected from the group consisting of yttrium, lanthanum, cerium, praseodymium,

neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, thulium, ytterbium, and lutetium.

As argued in Applicants' preliminary amendment dated August 30, 2005 (hereinafter "the August 30 Amendment"), neither Honda nor Hikosaka disclose, teach or suggest a first perpendicular magnetic recording layer formed on the nonmagnetic substrate at room temperature and a second perpendicular magnetic recording layer formed on the first perpendicular magnetic recording layer at room temperature, as recited in claims 1 and 18 and their dependent claims.

Honda merely discloses forming a perpendicular magnetic layer at a temperature of about 200 °C. Specifically, Honda discloses forming a magnetic recording media having a non-magnetic substrate and a magnetic film including at least two magnetic layers separated by a non-magnetic layer. Honda discloses that the stacked material is formed by placing the substrate under vacuum and by heating the substrate to a temperature of about 200°C. (*See* col. 17, lines 25-30). Honda further discloses that an under layer is then formed and that, under the same vacuum, a first magnetic layer is deposited. (*See* col. 17, lines 36-37). Subsequently to the deposition of the first layer, the non-magnetic layer and the second magnetic layer are created. (*See* col. 17, lines 37-52).

Hikosaka does not cure the deficiencies of Honda. Hikosaka merely discloses forming a CoCrPtO alloy at room temperature, but is silent as to further depositing a magnetic layer thereon.

In response to the August 30 Amendment, the Examiner indicated that the limitation(s) "formed on the nonmagnetic substrate at room temperature" is a process limitation and is not further limiting in terms of the structure resulting from the claimed process.

However, Applicants note that the structure implied by a process limitation should be considered when assessing the patentability of a claim over the prior art, especially where the manufacturing process step imparts distinctive structural characteristics to the final product. (*See* MPEP 2113 citing In re Garnero, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979)).

In the present case, Applicants respectfully submit that a magnetic recording medium having a perpendicular magnetic recording layer formed at room temperature and a magnetic recording medium having a perpendicular magnetic recording layer formed at high temperature have entirely different characteristics and that distinctive structural characteristics exist between the medium recited in claims 1 and 18, and their dependent

claims, and the medium disclosed by Honda and Hikosaka, as described in Applicant's Declaration under 37 CFR 1.132. (hereinafter "the Declaration").

The enclosed Declaration under 37 C.F.R. § 1.132 of Takeshi Iwasaki clearly establishes that (a) a magnetic recording medium having a perpendicular magnetic recording layer formed at room temperature and a magnetic recording medium having a perpendicular magnetic recording layer formed at high temperature have different characteristics (*see* comparative Experiments 3 and 5), (b) the formation of a perpendicular magnetic recording layer at room temperature provides unexpected properties to the magnetic recording medium, (c) these unexpected properties cannot be obtained unless the perpendicular magnetic recording layer is formed at room temperature (Experiment 1); and (d) these unexpected properties cannot be obtained by combining teachings of the references (comparative Experiments 1, 2, 4 and 6).

The enclosed declaration describes a first experiment in which a recording medium is prepared in accordance with an embodiment of the invention and six comparative experiments. Specifically, Experiment 1 corresponds to a medium as described in embodiment 7 of the present application. Comparative Experiment 1 corresponds to a medium wherein a CoPtO layer (formed at room temperature) of Example 8 of Hikosaka is overlaid on a magnetic layer (formed at 200°C) described in lines 45-53 of column 17 of Honda. Comparative Experiment 2 corresponds to a medium formed by first forming a undercoat layer described in lines 21-35 of column 17 of Honda, and then overlaying the undercoat layer with the two magnetic layers described in Comparative Experiment 1. Comparative Experiment 3 corresponds to a magnetic recording layer described in lines 4-12 of the lower right column of page 2 of Nippon Digital except that it is formed at room temperature (not at 100 to 200°C as described in JP02-103715A). Comparative Experiment 4 corresponds to a medium wherein a CoPtO layer (formed at room temperature) of Example 8 of Hikosaka is overlaid with the magnetic recording layer (formed at 100 to 200°C) described in lines 4-12 of the lower right column of page 2 of Nippon Digital. Comparative Experiment 5 corresponds to a CoCrPtNd layer described in Example 1 of Sakawaki except that it is formed at room temperature (not at 200°C as described in Sakawaki). Comparative Experiment 6 corresponds to the case where a CoPtO layer (formed at room temperature) described in Example 8 of Hikosaka is overlaid with a CoCrPtNd layer (formed at 200°C) described in Example 1 of Sakawaki.

As discussed in the Declaration, the differential waveform half width dPW50 (which is an index of the resolution) is 82 nm in Experiment 1 (related to the present invention). By contrast, the dPW50 is 124 nm in Comparative Experiment 1 and 118 nm in Comparative Experiment 2. Therefore, the resolution is significantly improved in Experiment 1 and is much better than in Comparative Experiment 1 and Comparative Experiment 2. Results also show that thermal decay resistance is significantly improved in Experiment 1 and is much better than in Comparative Experiment 1 and Comparative Experiment 2. Similar results are obtained when comparing Experiment 1 to Comparative Experiments 3-6.

As also discussed in the Declaration, magnetic crystal grains grown from the first perpendicular magnetic recording layer are allowed to grow without any restrictions in the medium as recited in claims 1 and 18 and their dependent claims. Accordingly, and unlike the cited references, the crystal orientation of the perpendicular magnetic recording medium is significantly improved, thus imparting structural differences between the claimed medium and the structures disclosed by Honda and Hikosaka.

Therefore, in view of the foregoing, Applicants respectfully request that the obviousness rejection of claims 1 and 18 be withdrawn.

Claims 2, 6-7 and 14-17 are patentable over Honda, Hikosaka and a combination thereof at least by virtue of their dependency from claim 1 and for the additional features recited therein. Similarly, claims 19-21 and 23-26 are patentable over Honda, Hikosaka and a combination thereof at least by virtue of their dependency from claim 18 and for the additional features recited therein.

Accordingly, reconsideration and withdrawal of the rejection of claims 1, 2, 6, 7, 14-21 and 23-26 under 35 U.S.C. §103(a) based on Honda in view of Hikosaka are respectfully requested.

Claims 11 and 22 were rejected under 35 U.S.C. §103(a) based on Honda in view of Hikosaka and Nippon Digital (JP 02-103715 A). The rejection is respectfully traversed for at least similar reasons as provided above in connection with claims 1 and 18.

Namely, claim 11 is patentable over Honda, Hikosaka and a combination thereof at least by virtue of its dependency from claim 1 and for the additional features recited therein. Similarly, claim 22 is patentable over Honda, Hikosaka and a combination thereof at least by virtue of its dependency from claim 18 and for the additional features recited therein.

Nippon Digital fails to remedy the deficiencies of Honda and Hikosaka. Nippon Digital merely discloses forming a magnetic layer at 100 to 200°C.

In addition, and as described in the Declaration, the formation of a perpendicular magnetic recording layer at room temperature imparts unexpected properties to the magnetic recording medium, as compared to a medium that would be prepared in accordance with the teachings of Honda, Hikosaka and Nippon Digital.

Accordingly, reconsideration and withdrawal of the rejection of claims 11 and 22 under 35 U.S.C. §103(a) based on Honda in view of Hikosaka and Nippon Digital are respectfully requested.

Claims 1, 2, 6-7, 11 and 14-28 were rejected under 35 U.S.C. §103(a) based on Honda in view of Sakawaki *et al.* (U.S. Application Publication No. 2003/0082407), and claims 1, 2, 6-7, 11 and 14-26 were rejected under 35 U.S.C. §103(a) based on Honda in view of Sakawaki (JP 2003-67910 A), which is the Japanese corresponding application of U.S. Application Publication No. 2003/0082407 (collectively referred to as "Sakawaki" hereinafter for the purpose of addressing these rejections). These rejections are respectfully traversed for at least similar reasons as provided above in connection with claims 1 and 18..

Claims 27 and 28 are cancelled without prejudice or disclaimer, thus rendering moot the rejection of these claims.

As mentioned previously, neither Honda nor Hikosaka disclose, teach or suggest the features of claims 1 and 18.

As argued in the August 30 Amendment, Sakawaki fails to remedy the deficiencies of Honda. Sakawaki merely discloses a magnetic recording medium having a non-magnetic substrate, an orientation-regulating layer for regulating the crystal orientation of a layer provided thereon, a perpendicular magnetic layer and a protective layer. (*See* paragraph [0065]). However, Applicants respectfully submit that Sakawaki does not disclose, teach or suggest a first perpendicular magnetic recording layer formed on the nonmagnetic substrate at room temperature.

The Examiner alleged at paragraph 7 of the Office Action that Sakawaki discloses forming a recording layer at 100°C or less. Applicants respectfully disagree and note that Sakawaki merely discloses in this cited excerpt forming a soft-magnetic liner layer such as a CoZrNb layer at 100°C or less, not a recording layer. In Sakawaki, the recording layer is formed at 200°C, as can be seen from paragraphs [0147], [0151], [0160], [0168], [0176] and [0182] of Sakawaki.

Furthermore, and as described in the Declaration, the formation of a perpendicular magnetic recording layer at room temperature imparts unexpected properties to the magnetic

recording medium, as compared to a medium that would be prepared in accordance with the teachings of Honda, Hikosaka and Sakawaki.

Claims 2, 6-7, 11 and 14-17 are patentable over Honda, Hikosaka, Sakawaki and a combination thereof at least by virtue of their dependency from claim 1 and for the additional features recited therein. Similarly, claims 19-26 are patentable over Honda, Hikosaka and a combination thereof at least by virtue of their dependency from claim 18 and for the additional features recited therein.

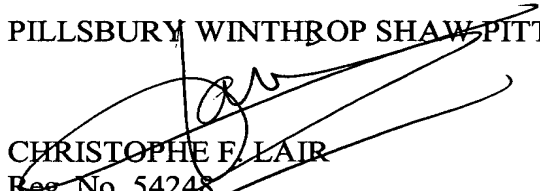
Accordingly, reconsideration and withdrawal of the rejections of claims 1, 2, 6-7, 11 and 14-26 under 35 U.S.C. §103(a) based on Honda in view of Sakawaki (U.S. Application Publication No. 2003/0082407) and claims 1, 2, 6-7, 11 and 14-26 under 35 U.S.C. §103(a) based on Honda in view of Sakawaki (JP 2003-67910 A) are respectfully requested.

The rejections having been addressed, Applicants request issuance of a notice of allowance indicating the allowability of all pending claims. If anything further is necessary to place the application in condition for allowance, Applicants request that the Examiner contact Applicants' undersigned representative at the telephone number listed below.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

PILLSBURY WINTHROP SHAW-PITTMAN LLP



CHRISTOPHE F. LAIR
Reg. No. 54248
Tel. No. 703.770.7797
Fax No. 703.770.7901

JPD/CFL/smm
P.O. Box 10500
McLean, VA 22102
(703) 770-7900

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